1. $\int \sin u \, du$ $\quad -\cos u + C$

2. $\int \frac{1}{\sqrt{1-u^2}} \, du$ $\quad \sin^{-1} u + C$

3. $\int \sec u \, du$ $\quad \ln|\sec u + \tan u| + C$

4. $\int a^u \, du$ $\quad \frac{a^u}{\ln a} + C$

5. $\int \frac{1}{1+u^2} \, du$ $\quad \tan^{-1} u + C$

Mar 29-7:26 AM

Review 16 derivative formulas

20 basic formulas - memorize

$$\frac{d}{dx}\left(\frac{\sec(x)}{(x^3+1)^4}\right)$$

$$\frac{(x^3+1)^4 \cdot \sec x \tan x - \sec(x) \cdot 4(x^3+1)^3 \cdot 3x^2}{(x^3+1)^8}$$

Mar 29-8:30 AM

parametric eqns

$x = f(t)$

$y = g(t)$

$\frac{dx}{dt}$

$\frac{dy}{dt}$

Chain rule for parametric eqns

$$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}}$$

$$\frac{dy}{dt} = \frac{dy}{dx} \cdot \frac{dx}{dt}$$

$$\frac{d^2y}{dx^2} = \frac{\frac{d}{dt}\left(\frac{dy}{dx}\right)}{\frac{dx}{dt}}$$

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$x = t^2 - t$

$y = t^3 + 1$

find $\frac{d^2y}{dx^2}$

$$\frac{dy}{dx} = \frac{3t^2}{2t-1}$$

$$\frac{d^2y}{dx^2} = \frac{\left[\frac{(2t-1)6t - 3t^2 \cdot 2}{(2t-1)^2}\right]}{2t-1}$$

$$= \frac{6t^2 - 6t}{(2t-1)^3}$$

Mar 29-8:40 AM